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# WATER SUPPLY OUTLOOK FOR MONTANA

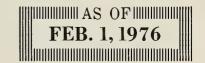


# U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.



#### TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most af the usable water in western states originates as mountain snowfall. This snowfall occumulates during the winter and spring, several months before the snow melts and oppears as streamflaw. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement af the water equivalent of the mountain snowpack.

Forecasts become more occurate os more of the dota affecting runoff ore measured. All forecosts ossume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant overage effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The overage of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys ore made monthly ar semi-monthly from Jonuary 1 through June 1 in most stotes. There are obout 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snaw water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detoiled doto on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a brand picture of water supply autlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and starage in larger reservairs.

Snow survey and soil maisture data for the period of record are published by the Soil Canservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SURVEYOR ENROUTE TO THE MT. BALDY ARIZONA SNOW COURSE

SCS PHOTO AZ-5460

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 111, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alasko	204 E. 5th. Ave., Raom 217, Anchorage, Alaska 99501
Arizona	6029 Federol Building, Phoenix, Arizono 85025
Colorodo (N. Mex.)	P. O. Box 17107, Denver, Colorodo 80217
Idoho	Room 345, 304 N. 8th. St., Boise, Idoho 83702
Montana	P.O. Box 98, Bazeman, Mantona 59715
Nevoda	P. O. Box 4850, Reno Nevodo 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utoh	4012 Federol Bldg., 125 South State St., Solt Loke City, Utah 84138
Woshington	360 U.S. Court House, Spokone, Woshington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

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#### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other ogencies include o report for Colifornio by the Woter Supply Forecast and Snaw Surveys Unit, Colifornio Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Woter Resources Service, Parliament Building, Victoria, British Columbia

# WATER SUPPLY OUTLOOK FOR MONTANA

and FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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# MONTANA WATER SUPPLY OUTLOOK February 1, 1976

\* The mountain snowpack is quite variable. In gereral, \* low elevations have a lesser snow cover, percentagewise, than higher elevations. This is a result of both storm deposition and melt from warm temperatures. A few snow courses in the headwaters of the Clark Fork \* \* and Flint Creek have record water content while some portions of the Yellowstone River headwaters have near \* \* record amounts. Portions of the Kootenai, Flathead, \* and Marias River systems have below average snow accum-\* ulation. \* \* Streamflow is forecast to be below average in the Marias and Milk River drainages, east of the divide, and near to below average in the Kootenai, Flathead, Sun River sk.  $\star$ \* \* area. Good soil moisture in the mountain watersheds \* will help runoff condition in the low snowpack areas. \* \* Much above average streamflow is forecast in the Upper Clark Fork area, west of the divide, and in portions of \* \* \* the Jefferson River drainage and the Yellowstone River Other areas should have above average runoff. 

#### COLUMBIA RIVER DRAINAGE

<u>Snow</u> - Snow water content varies from near record amounts in the Upper Clark Fork to below average in portions of the Kootenai and Flathead drainages. Some melt has occurred at lower elevations. A heavy snow-pack is present in the higher elevations of the Clark Fork River headwaters.

<u>Streamflow</u> - Spring and summer runoff is forecast to be a little below to near average in the Kootenai, Flathead, and Lower Clark Fork River basins. Above average amounts of moisture are stored in the soil under the snow-pack, and this will help increase the yield from the below average snow cover. Above average runoff is expected over most of the Bitterroot and Blackfoot River drainages. Above average runoff can be expected in the Upper Clark Fork basin.



## MISSOURI RIVER DRAINAGE

<u>Snow</u> - Snow cover is quite variable ranging from below average along the Montana-Idaho border in the Red Rock River drainage and in the Marias River headwaters to near record amounts along the Continental Divide in the vicinity of Butte. Most drainages have snow cover 10 to 20 percent above average.

<u>Streamflow</u> - Runoff during the spring and summer months is forecast 10 to 20 percent above average in most southern drainages. Near average flow is expected in the Sun River drainage while below average runoff is forecast in the Milk and Marias Rivers. Moisture stored in the soil under the snowpack is above average.

#### YELLOWSTONE RIVER DRAINAGE

<u>Snow</u> - A heavy snowpack covers most of the Yellowstone headwaters with some snow courses having near record amounts of water equivalent. The entire basin shows about 25 percent more water content than normally expected on this date.

<u>Streamflow</u> - Spring and summer runoff should be well above average with most streams flowing in the 130 to 140 percent average range. Soils under the snowpack contain above average amounts of water.



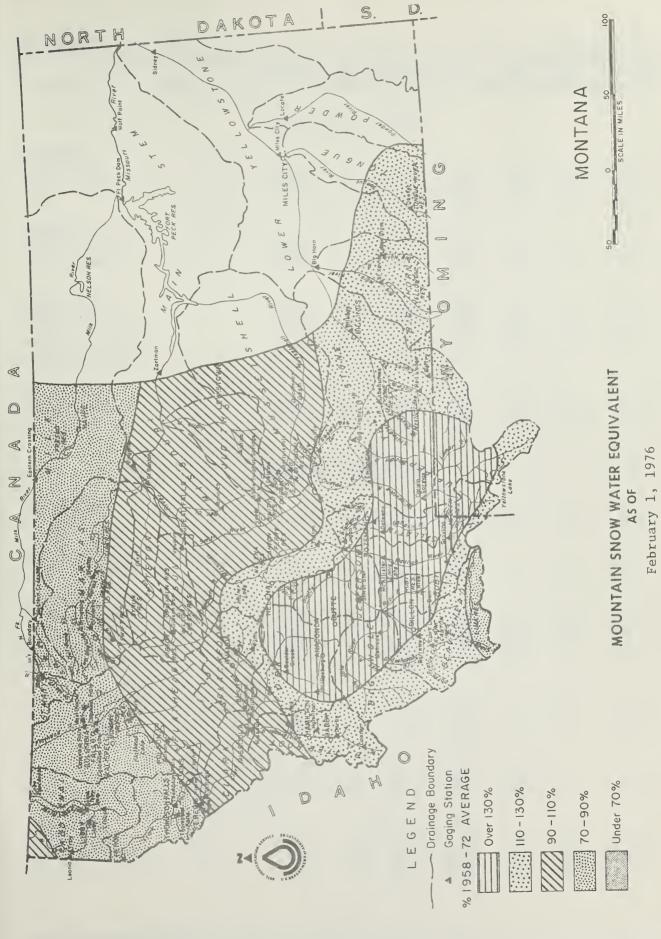
February 1, 1976



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RIVER BASIN and/or SUB-WATERSHED	Number of Courses	THIS YEAR'S SNOW WATER AS PERCENT OF		
	Averaged	Last Year	Average	
COLUMBIA RIVER DRAINAGE				
Kootenai	8	91	83	
Flathead	12	101	91	
Upper Clark Fork	21	116	125	
Lower Clark Fork	4	104	99	
Bitterroot	6	107	121	
MISSOURI RIVER DRAINAGE.				
Jefferson	20	123	114	
Madison	10	151	120	
Gallatin	11	120	118	
Missouri Main Stem	6	108	112	
Judith-Musselshell	2	104	106	
Marias-Teton-Sun	4	112	89	
Milk	3	86	76	
YELLOWSTONE RIVER DRAINAGE				
Yellowstone (above Bighorn)	14	147	126	
Bighorn	33	101	123	
Little Bighorn	7	96	127	
Tongue	12	88	120	
Powder	6	117	124	
SASKATCHEWAN RIVER DRAINAGE				
Bow	4	126	114	
	-4-			







SOIL MOISTURE

	N		e (Inches)	Date of	Soil Moisture (Inc			
Name	Elevation	Depth	Capacity	Survey	This Year	Last Year	Average	
	COLLABORA	D. 7.1791	DAGTI					
	COLUMBIA	KIVER	BASIN					
Kootenai								
Baree Trail	3800	48	7.5	-		_	-	
Murphy Lake R. S.	3000	48	22.6	2/01	19.5	19.0	19.4	
Raven	3050	48	23.0	2/03	16.9	15.8	18.9	
Flathead								
Desert Mountain	5600	54	8.4	1/30	8.7	5.5	7.0	
Marias Pass	5250	54	6.5	1/21	6.2	3.9	5.1	
Clark Fork								
Black Pine	7100	48	10.0	1/28	8.3	7.3	7.4	
ubrecht Forest	4100	48	26.8	2/02	23.8	15.0	15.2	
Seeley Lake R. S.	4030	48	11.9	2/02	11.7	7.7	7.6	
Skalkaho Summit	7260	48	10.8		-	-	-	
Bitterroot								
Gibbons Pass	7100	48	7.1	1/28	5.9	3.4	4.8	
Lolo Pass	5250	48	10.6	1/30	7.3	3.8	5.9	
	MISSOURI	RIVER	BASIN					
Beaverhead								
Lakeview	6700	48	15.3	1/30	10.9	8.2	9.0	
Madison								
West Yellowstone	6700	48	6.5	1/30	1.9	1.7	2.6	
Gallatin		*						
Bridger Bowl	7250	48	17.0	1/26	15.0	15.0	15.8	
College Site No. 2	4856	54	17.7	1/30	16.8	15.2	13.2	
Lick Creek	6860	48	18.8	1/29	14.1	-	16.5	
Wenty-One Mile	7150	48	10.0	1/30	3.8	3.0	4.7	
Missouri Main Stem								
Kings Hill	7420	48	11.8	1/28	7.7	7.1	6.9	
Stemple Pass	6350	48	5.9	1/30	5.3	3.5	4.0	
Milk								
Beaver Creek	3950	48	20.9	1/23	8.6	-	7.6	
Rocky Boy	4700	36	10.1	1/26	8.5	8.2	7.2	
Yellowstone								
Battle Ridge	6020	48	17.6	1/26	12.7	14.7	13.1	
Dattie Riage								
Northeast Entrance	7350	48	9.4	1/2/	4.9	3.8	6.0	
	7350 3700	48 48	9.4 20.7	1/27 2/02	4.9 5.9	3.8 6.4	6.0 -	

<sup>-6-</sup>



# RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

RESERVOIR STORAGE (1110	addit Adio 100ty ENG OF NO	T		Usable Storage	
Basin or Stream	RESERVOIR	Usable Capacity	This Year	Last Year	Average
COLUMBIA RIVER BASIN	ī				
COLUMBIA RIVER DASIF	<u>v</u>				
Kootenai	Koocanusa	5,694.0	2,450.0	2,145.0	_
Flathead	Hungry Horse	3,428.0		1,990.0	2,484.0
	Flathead Lake	1,791.0		1,085.0	1,246.0
	Camas (4)	45.2	17.5	17.8	23.0
	Mission Valley (8)	100.3	57.1	30.4	33.2
Clark Fork	Georgetown Lake	31.0	29.6	25.0	27.0
	Lower Willow Creek		3.5	1.3	1.2
	Nevada Creek	12.6	9.5	-	4.8
	Noxon Rapids	334.6	303.5	313.1	320.8
Bitterroot	Como	34.9	25.6	-	11.0
520002000	Painted Rocks	31.7	27.1	0.0	22.0
	razneca nocho	31.7	27.1	0.0	22.0
MISSOURI RIVER BASIN	I				
	-				
Beaverhead	Clark Canyon	328.9	153.0	107.5	140.6
	Lima	84.0	-	43.5	31.6
Ruby	Ruby	38.8	21.6	_	23.4
Madison	Hebgen Lake	377.5	288.3	249.5	201.5
	Ennis Lake	41.0	34.2	33.9	37.7
Gallatin	Middle Creek	8.0	3.6	4.2	3.3
Missouri	Canyon Ferry	2,043.0	1,773.0	1,543.0	1,639.0
	Hauser & Helena	61.9	63.0	63.6	58.0
	Lake Helena	10.4	10.9	11.1	9.2
	Holter Lake	81.9	78.6	79.9	61.8
	Smith River	10.6		_	5.8
	Bair	7.0		_	4.2
	Martinsdale	23.1		_	7.5
	Deadman's Basin	72.2		_	43.6
	Fort Peck Lake		17,540.0	15,970.0	13,220.0
Sun	Gibson	99.0	67.9	58.7	39.1
	Willow Creek	32.2	27.6	_	18.9
	Pishkun	32.0	17.6	_	17.5
Marias	Lower Two Medicine	11.9		_	_
	Four Horns	19.2		_	_
	Swift	30.0	21.9	9.0	16.2
	Lake Frances	111.9	93.3	30.7	78.0
	Tiber	1,347.0	581.3	497.2	577.1
Milk	Beaver Creek	3.5	1.3	1.5	_
	Fresno	127.2	105.6	83.1	56.2
	Nelson	66.8	50.6	47.9	42.6
	Lake Sherburne	66.2	30.2	16.9	18.5
Yellowstone	Mystic Lake	21.0	7.2	7.7	10.9
	Tongue River	68.0		29.1	27.8
	Cooney	27.4	12.0	12.2	13.8
Bighorn	Bighorn Lake	1,356.0	868.4	826.5	792.5



STREAMFLOW FORECASTS		THIS YEAR			RECORD
	FORECAST		FORECAST	THOUSAND	ACRE FEET
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feet	Percent of Average	PERIOD	Last Year	Average

	COLUMBIA RIVER	BASIN			
KOOTENAI RIVER					
Libby (near) (2)	7,150	96	Apr-Sept	6,388	7,456
Below Libby Dam	6,150	96	Apr-July	5,292	6,417
	4,800	96	Apr-June	3,890	5,011
FISHER RIVER					
Libby (near)	285	100	Apr-Sept		286
WAAR DIND	270	100	Apr-July		269
YAAK RIVER	F70	101	A		F.C.0
Troy (near)	570 550	101 101	Apr-Sept Apr-July		568 544
KOOTENAI RIVER	330	101	Apr-July		344
Leonia (at) (2)	8,900	98	Apr-Sept	8,093	9,073
Beofila (ac) (2)	7,800	98	Apr-July		7,957
	6,300	98	Apr-June	5,298	6,431
FLINT CREEK	,		1	Í	,
Boulder Creek (below) (3)	91.0	127	Apr-Sept		71.6
	75.0	134	Apr-July		56.1
MIDDLE FORK ROCK CREEK					
Philipsburg (near)	93.0	123	Apr-Sept		75.9
NEWADA CREEK	85.0	124	Apr-July		68.6
NEVADA CREEK	20.0	10/	A C t		21 (
Finn (near)	29.0 27.5	134 137	Apr-Sept Apr-July		21.6
BLACKFOOT RIVER	27.5	137	Apr-July		20.1
Bonner (near)	1,300	126	Apr-Sept	1,371	1,031
bonner (near)	1,200	128	Apr-July	1,227	934
	1,040	128	Apr-June	974	814
CLARK FORK RIVER	•		•		
Milltown (above) (4)	1,000	126	Apr-Sept	1,352	792
	900	130	Apr-July	1,133	690
	760	129	Apr-June	858	590
CLARK FORK RIVER					
Missoula (above)	2,300	126	Apr-Sept	2,722	1,823
	2,100	129	Apr-July	-	1,624
	1,800	128	Apr-June	1,832	1,404

<sup>(2)</sup> Adjusted for storage in Lake Koocanusa.

<sup>(3)</sup> Sum Flint Creek at Maxville and Boulder Creek at Maxville.

<sup>(4)</sup> Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.



STREAMFLOW FORECASTS	THIS YEAR			PAST RECORD		
	FORECAST		FORECAST	THOUSAND	ACRE FEET	
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feet	Percent of Average	PERIOD	Last Year	Average	
WEST FORK BITTERROOT RIVER						
Conner (near) (5)	230	10/	A C tr		172	
conner (near) (3)	210	134	Apr-Sept Apr-July		156	
BITTERROOT RIVER	210	135	Apr-July		100	
Darby (near)	750	128	Apr-Sept	736	584	
Daiby (Heal)	700	129	Apr-July	662	542	
	620	129	Apr-June	502	479	
SKALKAHO CREEK	020	12)	Apr June	302	7/2	
Hamilton (near)	67.5	119	Apr-Sept		56.6	
name took (neet)	60.0	121	Apr-July		49.6	
BURNT FORK CREEK	00.0	121	mpr oury		.,,,,	
Stevensville (near) (10)	43.0	122	Apr-Sept		35.3	
(	37.5	121	Apr-July		31.0	
BITTERROOT RIVER						
Missoula (at) (6)	1,880	123	Apr-Sept		1,527	
	1,750	124	Apr-July		1,412	
	1,530	124	Apr-June		1,236	
CLARK FORK RIVER						
Missoula (below)	4,180	125	Apr-Sept		3,350	
	3,850	127	Apr-July		3,036	
	3,330	126	Apr-June		2,640	
CLARK FORK RIVER						
St. REgis (at)	5,300	118	Apr-Sept	5,750	4,507	
	4,850	119	Apr-July	5,035	4,087	
	4,200	118	Apr-June	3,805	3,563	
NORTH FORK FLATHEAD RIVER						
Columbia Falls (near)	1,820	91	Apr-Sept		1,991	
	1,660	92	Apr-July		1,813	
	1,420	92	Apr-June		1,551	
MIDDLE FORK FLATHEAD RIVER						
West Glacier (near)	1,700	89	Apr-Sept	2,330	1,917	
	1,600	90	Apr-July	-	1,768	
COVIDIA DODIA DA LINVIA DE CONTRA DE	1,350	89	Apr-June	1,687	1,514	
SOUTH FORK FLATHEAD RIVER	0.000	0.0		0 500	0 070	
Columbia Falls (near) (7)	2,200	92	Apr-Sept	2,520	2,378	
	2,050	92	Apr-July		2,240	
	1,800	91	Apr-June	1,856	1,984	

<sup>(5)</sup> Adjusted for storage in Painted Rocks Reservoir.

<sup>(6)</sup> Difference in observed flow Clark Fork above and below Missoula.

<sup>(7)</sup> Adjusted for storage in Hungry Horse Reservoir.

<sup>(10)</sup> Adjusted for diversion into Sunset Highline Canal.



STREAMFLOW FORECASTS	THIS YEAR			PAST RECORD		
	FOR	ECAST	FORECAST	THOUSAND ACRE FEET		
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feet	Percent of Average	PERIOD	Last Year	Average	
FLATHEAD RIVER						
Columbia Falls (at) (7)	5,850	91	Apr-Sept	6,794	6,421	
columbia falls (at) (7)	5,450	92	Apr-July		5,942	
	•	92			-	
SWAN RIVER	4,750	92	Apr-June	3,041	5,151	
Big Fork (near)	730	102	Apr-Sept		717	
big fork (mear)	650	103	Apr-July		630	
FLATHEAD RIVER	050	103	Api-July		030	
Polson (near) (8)	7,050	92	Apr-Sept	7,895	7,648	
1015011 (licar) (0)	6,580	93	Apr-July	•	7,040	
	5,600	92	Apr-June	•	6,113	
CLARK FORK RIVER	5,000	72	Apr-3dile	2,031	0,113	
Plains (near) (8)	13,000	103	Apr-Sept	1/- 101	12,601	
Tiding (near) (0)	11,830	103	Apr-July	•	11,523	
	10,100	102	Apr-June		9,934	
THOMPSON RIVER	10,100	102	Apr Julie	,,00	7,754	
Thompson Falls (near)	275	99	Apr-Sept		277	
mompson raris (near)	250	101	Apr-July		248	
PROSPECT CREEK	250	101	npr oury		240	
Thompson Falls (at)	145	99	Apr-Sept		147	
Thompson ratts (ac)	135	99	Apr-July		137	
CLARK FORK RIVER	133		ripr dury		137	
Whitehorse Rapids (at) (9)	14,400	102	Apr-Sept		14,336	
	13,200	103	Apr-July		13,086	
	11,300	102	Apr-June		11,325	

<sup>(7)</sup> Adjusted for storage in Hungry Horse Reservoir.

<sup>(8)</sup> Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.

<sup>(9)</sup> Adjusted for storage in Hungry Horse, Flathead Lake, and Noxon Rapids Reservoirs.



STREAMFLOW FORECASTS		THIS YEAR		PAST	RECORD
	FORECAST FORECAST		THOUSAND ACRE FEET		
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feer	Percent of Average	PERIOD	Last Year	Average

	MISSOURI RIVER	BASIN			
BEAVERHEAD RIVER					
Grant (near) (11) (12)	167	115	Apr-Sept	295	145
nn	150	118	Apr-July	248	127
RUBY RIVER					
Alder (near)	110	117	Apr-Sept		93.9
BIG HOLE RIVER	95.0	120	Apr-July		79.4
Melrose (near)	950	127	Apr-Sept		748
nerrose (near)	880	127	Apr-July		694
BIRCH CREEK	300		mpr odry		0,7
Glen (near)	17.3	126	Apr-Sept		13.7
	14.5	126	Apr-July		11.5
BOULDER RIVER					
Boulder (near)	110	123	Apr-Sept	184	89.5
UTILOU CREEK	105	123	Apr-July	170	85.3
WILLOW CREEK Harrison (near)	25.5	135	Ann Cont		18.9
nailison (hear)	23.0	135	Apr-Sept Apr-July		17.1
MADISON RIVER	23.0	133	Apribaty		1/•1
Grayling (near) (13)	560	117	Apr-Sept	529	480
	450	123	Apr-July	410	374
MADISON RIVER					
McAllister (near) (14)	980	118	Apr-Sept	998	828
	800	123	Apr-July	792	652
GALLATIN RIVER	(20	110	A C		501
Gateway (near)	630 550	119 122	Apr-Sept Apr-July		531 451
	330	122	Apr-Jury		4.31

<sup>(11)</sup> Adjusted for storage in Lima Reservoir.

<sup>(12)</sup> Adjusted for storage in Clark Canyon Reservoir.

<sup>(13)</sup> Adjusted for storage in Hebgen Lake.

<sup>(14)</sup> Adjusted for storage in Hebgen and Ennis Lakes.



STREAMFLOW FORECASTS		THIS YEAR			PAST RECORD	
	FORE	CAST	FORECAST	THOUSAND	ACRE FEET	
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feer	Percent of Average	PERIOD	Last Year	Average	
HYALITE CREEK						
Bozeman (near) (15)	51.0	115	Apr-Sept		44.2	
	45.0	118	Apr-July		38.2	
GALLATIN RIVER						
Logan (at)	750	131	Apr-Sept		573	
	650	133	Apr-July		487	
MISSOURI RIVER						
Toston (at) (16)	3,160	130	Apr-Sept	3,875	2,432	
SHEEP CREEK	2,780	132	Apr-July	3,280	2,109	
White Sulphur Springs (near)	22.0	107	Anw Cont		20.6	
white Sulphul Spilligs (heal)	19.0	106	Apr-Sept Apr-July		18.0	
SUN RIVER	17.0	100	Apr-Jury		10.0	
Gibson Dam (at) (17)	545	92	Apr-Sept	829	590	
	500	92	Apr-July	764	541	
BELT CREEK						
Monarch (near)	150	122	Apr-Sept		123	
	140	124	Apr-July		113	
MISSOURI RIVER						
Fort Benton (at) (18)	4,400	119	Apr-Sept		3,690	
TWO MEDICINE CREEK	3,780	121	Apr-July		3,123	
Browning (near) (19)	220	87	Apr-Sept		253	
blowning (hear) (19)	210	88	Apr-July		240	
BADGER CREEK	210	00	Apr-Jury		240	
Browning (near)	116	89	Apr-Sept		130	
, , ,	100	88	Apr-July		113	
MARIAS RIVER						
Shelby (near) (20)	500	89	Apr-Sept	1,216	599	
	470	.87	Apr-July	1,138	538	

<sup>(15)</sup> Adjusted for storage in Middle Creek Reservoir.

<sup>(16)</sup> Adjusted for storage in Hebgen and Ennis Lakes and Clark Canyon Reservoir.

<sup>(17)</sup> Adjusted for storage in Gibson Reservoir and diversions.

<sup>(18)</sup> Adjusted for storage in Canyon Ferry Reservoir.

<sup>(19)</sup> Adjusted for storage in Two Medicine Reservoir and diversions into Two Medicine Canal.

<sup>(20)</sup> Adjusted for storage in Two Medicine, Four Horns, Lake Frances, and Swift Reservoirs.



STREAMFLOW FORECASTS	THIS YEAR			PAST RECORD	
	FORECAST		FORECAST	THOUSAND ACRE FEET	
BASIN, STREAM and/or FORECAST POINT	Thousand Acre Feet	Percent of Average	PERIOD	Last Year	Average
MISSOURI RIVER					
Virgelle (at) (21)	5,100	117	Apr-Sept		4,342
	4,400	118	Apr-July		3,742
SOUTH FORK JUDITH RIVER	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	110	1191 041)		3,7.2
Utica (near)	15.0	101	Apr-Sept		14.9
	14.0	102	Apr-July		13.7
MISSOURI RIVER			. ,		
Landusky (near) (21)	5,450	115	Apr-Sept		4,739
	4,800	118	Apr-July		4,068
NORTH FORK MUSSELSHELL RIVER					
Delpine (near)	7.0	113	Apr-Sept		6.2
	6.0	111	Apr-July		5.4
SOUTH FORK MUSSELSHELL RIVER					
Martinsdale (above)	58.0	116	Apr-Sept		50.1
	54.0	114	Apr-July		47.3
MISSOURI RIVER					
Fort Peck Dam (below) (22)	5,400	117	Apr-Sept		4,598
	4,800	118	Apr-July		4,069
MILK RIVER					
Eastern Crossing (at)	235	82	Mar-Sept		286
MISSOURI RIVER					
Wolf Point (near) (22)	5,800	118	Apr-Sept		4,898
ATGGOUDT DIVING	5,150	118	Apr-July		4,361
MISSOURI RIVER	1/ 000	106	4 . 0 .		11 770
Williston, N.D. (Near) (29)	14,800	126	Apr-Sept		11,778
	13,300	127	Apr-July		10,437
VACA	ATCHEWAN RIVE	D RACTN			
SASK	ATOHEWAN KIVE	I DROIN			
ST. MAYR RIVER					
Babb (near) (30)	475	97	Apr-Sept		489
222 (11042) (00)	410	97	Apr-July		421

<sup>(21)</sup> Adjusted for storage in Canyon Ferry and Tiber Reservoirs.

<sup>(22)</sup> 

Adjusted for storage in Canyon Ferry, Tiber, and Fort Peck Reservoirs. Adjusted for storage in Canyon Ferry, Tiber, Fort Peck, Buffalo Bill, (29)Boysen, and Yellowtail Reservoirs. Sum Yellowstone River near Sidney and Missouri River near Culbertson.

<sup>(30)</sup> Adjusted for storage in Lake Sherburne.



STREAMFLOW FORECASTS	THIS YEAR			PAST RECORD	
	FORECAST		FORECAST	THOUSAND ACRE FEET	
BASIN, STREAM and or FORECAST POINT	Thousand Acre Feet	Percent of Average	PERIOO	Last Year	Average

	YELLOWSTONE RIVER	BASIN			
YELLOWSTONE RIVER					
Corwin Springs (at)	2,600 2,200	130 132	Apr-Sept Apr-July	-	1,996 1,662
YELLOWSTONE RIVER	2,200	152	npr odry	1,771	1,002
Livingston (near)	3,050 2,580	132 134	Apr-Sept Apr-July		2,317 1,926
BOULDER RIVER					
Big Timber (at)	530 500	140 143	Apr-Sept Apr-July		379 350
STILLWATER RIVER					
Absarokee (near) (25)	780 680	132 138	Apr-Sept Apr-July		591 494
CLARKS FORK RIVER	2.4.2	100			607
Belfry (near)	840 750	138 137	Apr-Sept Apr-July		607 546
ROCK CREEK	750	137	Apr-Jury		540
Red Lodge (near)	147	134	Apr-Sept	140	110
	120	143	Apr-July	111	84.0
YELLOWSTONE RIVER					
Billings (at)	5,900	139	Apr-Sept		4,246
BIGHORN RIVER	5,130	142	Apr-July	5,608	3,613
St. Xavier (near) (26)	2,150	116	Apr-Sept	2,497	1,849
St. Mavier (hear) (20)	2,000	117	Apr-July		1,706
LITTLE BIGHORN RIVER	,		1 3	,	,
Lodgegrass (near) (28)	170	116	Apr-Sept		146
	150	116	Apr-July		129
YELLOWSTONE RIVER	0.000	100			6 270
Miles City (at) (27)	8,200	129 133	Apr-Sept Apr-July		6,378
YELLOWSTONE RIVER	7,400	133	Apr-July		5,555
Sidney (near) (27)	8,900	134	Apr-Sept		6,665
	8,000	136	Apr-July		5,895

<sup>(25)</sup> Adjusted for storage in Mystic Lake.

<sup>(26)</sup> Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, and Yellowtail Reservoirs.

<sup>(27)</sup> Adjusted for storage in Buffalo Bill, Boysen, and Yellowtail Reservoirs.

<sup>(28)</sup> Sum Little Bighorn below Pass Creek and Lodgegrass Creek near Wyola.



DRAIN ACT DASIN 1/ SNOW COURSE			1	PAST RECORD  Water Content (inches)		
DRAINAGE BASIN and/or SNOW COURSE  NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content L	Last Year	Average
IVATE	Elevation				2031 100	- Therage
RCH FALLS	7350	1/29	37	12.3	11.2	8.
ADGER PASS	6900	1/30	90	31.5A	24.0	30.
ANFIELD MOUNTAIN	5600	1/29	46	15.8		19.
ANFIELD MOUNTAIN PILLOW	5600	1/29	SP	14.3	15.0	16.
ATTLE RIDGE	6020	1/26	21	6.7	5.8	6.
EAR PAN SKI AREA	5200	1/26	13	3.5	4.6	4.
IG SKY	7700	1/28	43	13.2	10.7	_
IG SPRINGS (ID)	6500	1/29	50	15.3	10.5	14.
LACK BEAR	7950	1/30	90	34.0	20.7	
LACK BEAR PILLOW	7950	1/30	SP	28.8	19.1	
LACK PINE	7100	1/28	40	12.4	9.9	7.
LACK PINE PILLOW	7100	1/28	SP	14.6	10.4	9.
LUE LAKE	5900	1/30	52	17.5A	15.5	20.
OW RIVER #1 (AL)	5100	1/29	29	7.0	6.3	
OXELDER CREEK	5100	1/26	22	3.8	-	6.
	7250	1/26	72	23.7	15.6	20
RIDGER BOWL	_					20.
RIDGER BOWL PILLOW	7250	1/26	SP	22.6	14.8	18.
RISTOW CREEK	3900	1/29	18	5.6	. O	-
ULL MOUNTAIN	6600	2/02	18	4.4	4.9	=
AMP CREEK (ID)	6800	1/30	24	6.3	5.7	7.
ANYON (WY)	7750	2/01	46	13.8	8.6	10.
ARROT BASIN	9000	1/30	75	28.1	23.2	27.
ARROT BASIN PILLOW	9000	1/30	SP	21.2	14.2	19.
ARTER CREEK	7400	2/01	19	4.7	3.9	3.
EDAR GROVE	4100	1/28	23	7.3	-	-
HESSMAN RESERVOIR	6200	1/29	6	1.5	3.3	2.
OLE CREEK	7850	2/02	46	13.4	16.4	~
OLE CREEK PILLOW	7850	1/27	SP	31.2	13.9	-
OLLEY CREEK	6300	1/30	30	8.0	-	
OMBINATION PILLOW	5600	1/28	SP	4.6	4.7	800
OOKE STATION	8150	1/27	61	20.0	13.6	-
OPPER MOUNTAIN	7700	1/27	39	11.6	9.0	8.
OYOTE HILL	4200	2/02		8.8	9.4	8.
ALY CREEK	5780	1/30	34	9.4	9.4	-
AVIS CREEK	5400	1/27	44	15.8	946	-
EADMAN CREEK	6450	1/28	30	9.2	9.4	8.
EADMAN CREEK PILLOW	6450	1/28	SP	7.5	8.7	8.
ESERT MOUNTAIN	5600	1/30	31	9.4	9.1	11.
EVILS SLIDE	8100	1/29	58	19.1	18.2	15.
ISCOVERY BASIN	7050	1/28	33	9.2	8.9	We We
IX HILL	6400	2/01	29	9.0	7.0	-
MERY CREEK	4350	1/30	32	9.1	-	••
ISHER CREEK	9100	1/27	93	33.0	19.3	24.
LEECER RIDGE	7500	2/02	39	11.8	8.4	800
ROHNER MEADOWS	6480	1/30	23	6.4	6.5	
ROHNER MEADOWS PILLOW	6480	1/30	SP	4.0	6.6	-
ARVER CREEK	4250	1/27	17	4.7		9.
ARVER CREEK PILLOW	4250	1/27	SP	5.1	7.5	8.



DRAINAGE BASIN and/or SNOW COURSE  NAME  Elevation  GIBBONS PASS  GRAVE CREEK  GRAVE CREEK PILLOW  GRIZZLY PEAK  HAWKINS LAKE  HAWKINS LAKE PILLOW  HEBGEN DAM  HELL ROARING DIVIDE  STORMAND	0 1/28 0 1/28 0 1/26 0 2/02 0 1/27 0 1/27	60 36 0 42 67	20.6 10.3 10.3	Water Conter Last Year	Average
GIBBONS PASS  GRAVE CREEK  GRAVE CREEK PILLOW  GRIZZLY PEAK  HAWKINS LAKE  HAWKINS LAKE PILLOW  HEBGEN DAM  HELL ROARING DIVIDE  710  645  645	on of Survey  0 1/28 0 1/28 0 1/26 0 2/02 0 1/27 1/27	60 36 0 42	20.6 10.3 10.3	17.6	16.0
GRAVE CREEK GRAVE CREEK PILLOW 430 GRIZZLY PEAK HAWKINS LAKE HAWKINS LAKE PILLOW HEBGEN DAM 655 HELL ROARING DIVIDE	0 1/28 0 1/26 0 2/02 0 1/27 0 1/27	36 0 42	10.3	-	
GRAVE CREEK GRAVE CREEK PILLOW 430 GRIZZLY PEAK HAWKINS LAKE HAWKINS LAKE PILLOW HEBGEN DAM HELL ROARING DIVIDE 577	0 1/28 0 1/26 0 2/02 0 1/27 0 1/27	36 0 42	10.3	-	
GRAVE CREEK GRAVE CREEK PILLOW 430 GRIZZLY PEAK HAWKINS LAKE HAWKINS LAKE PILLOW HEBGEN DAM HELL ROARING DIVIDE 577	0 1/28 0 1/26 0 2/02 0 1/27 0 1/27	36 0 42	10.3	-	
GRAVE CREEK PILLOW 430 GRIZZLY PEAK 840 HAWKINS LAKE 645 HAWKINS LAKE PILLOW 645 HEBGEN DAM 655 HELL ROARING DIVIDE 577	0 1/26 0 2/02 0 1/27 0 1/27	0 42	10.3		
GRIZZLY PEAK HAWKINS LAKE HAWKINS LAKE PILLOW HEBGEN DAM HELL ROARING DIVIDE 577	0 2/02 0 1/27 0 1/27	42			-
HAWKINS LAKE HAWKINS LAKE PILLOW HEBGEN DAM HELL ROARING DIVIDE 577	0 1/27 0 1/27	· ·		14.8	11.6
HAWKINS LAKE PILLOW HEBGEN DAM 655 HELL ROARING DIVIDE 577	0 1/27		25.4	-	23.2
HERGEN DAM 655 HELL ROARING DIVIDE 577		SP	22.6	21.3	21.6
HELL ROARING DIVIDE 577	0 1/26	34	11.4	8.3	8.2
= 8 m; n = 8 m;		59	21.0	25.4	23.3
HOLBROOK 453	_	35	8.5A	9.0	8.0
HOOD MEADOW 660		34	9.8	9.8	7.9
HOODOO BASIN PILLOW 600	-	SP	35.4	32.4	36.1
INTERGAARD 645	-	32	10.0	5.9	6.0
ISLAND PARK (ID) 631		44	12.9	9.2	11.6
KILGORE (ID) 620		28	7.9	10.9	7.9
KINGS HILL 750	-	37	11.6	-	**
KIWANIS CAMP 372		0	• 0	2.1	400
LAKE CAMP (WY) 785	-	34	8.8	4.9	6.0
LAKE CREEK 610		26	7.2	6.5	4.9
LAKEVIEW CANYON 693		30	8.2	6.4	9.8
LAKEVIEW RIDGE 740	- "	26	7.6	5.4	8.8
LEMHI PASS 748	-	30	9.3	-	
LEMHI RIDGE 810	-	36	11.4	-	-
LEMHI RIDGE PILLOW 810		0	10.9		-
LICK CREEK 686	-	33	9.3	8.6	6.8
LICK CREEK PILLOW 686		SP	8.6	7.6	6.1
LOLO PASS (ID) 523		76	24.7	22.4	22.9
LONE MOUNTAIN 888		51	16.6	16.4	
LOOKOUT (ID) 525		71	23.4	27.2	26.7
LOST SOUL 480		32	9.0	-	
LUBRECHT FLUME 480		21	6.3	5.5	5.6
LUBRECHT FOREST # 3 545		21	5.9	8.4	5.6
LUBRECHT FOREST # 4 465		7	1.8	5.1	3.2
LUBRECHT FOREST # 6 404	0 2/03	8	2.2	4.8	3.8
LUBRECHT HYDROPLOT 420			6.0	5.0	5.1
LUPINE CREEK (WY) 730	0 1/30	34	9.2	5.5	7.7
MADISON PLATEAU 775			19.6		15.4
MADISON PLATEAU PILLOW 775	0 1/30	SP		12.5	16.6
MARIAS PASS 525			9.9	11.1	13.2
MAYNARD CREEK 621	0 1/26	38	11.8	9.3	13.7
MAYNARD CREEK PILLOW 621	-	SP	7.3	7.4	8.8
MEADOW CREEK PILLOW 400	0 1/20		3.4	7.2	100
MILL CREEK 750			12.9	-	-
MIRROR LAKE #6 (AL) 660	-		11.2	7.2	8.4
MOOSE CREEK (ID) 620	-	41	14.1		11.8
MOUNT LOCKHART 640	_	56	19.6	14.4	-
MOUNT LOCKHART PILLOW 640		SP	15.8		15.6
MT. EISENHOWER #10 (AL) 500			4.1	3.8	4.1
NEW WORLD 690			15.0		10.2
NEZ PERCE CREEK 650			6.3	5.4	5.4
NOISY BASIN 604	-	81	27.9	31.0	-

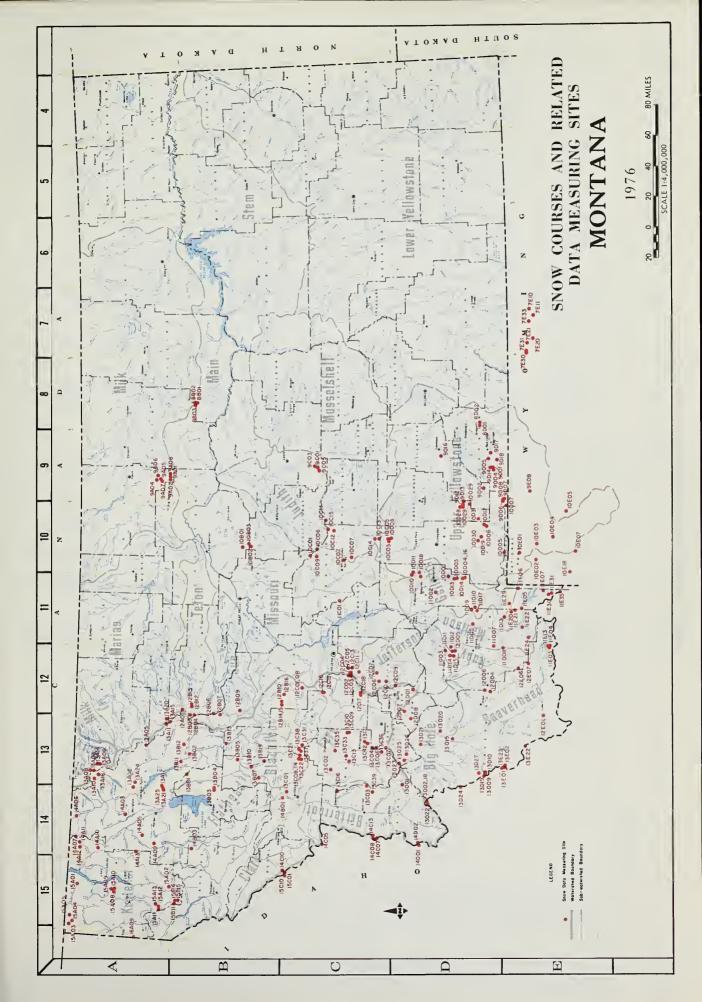


SNOW	/	THIS YEAR		PAST RECORD			
DRAINAGE BASIN and/or SNOW COURSE	Date	Snow Depth	Water Content	Water Conter	nt (inches)		
NAME	Elevation	of Survey	(Inches)	(Inches)	Last Year	Average	
					···		
NOISY BASIN PILLOW	6040	1/29	SP	25.5	25.3	_	
NOISY CREEK	3600	1/29	8	2.4	4.4		
NORRIS BASIN (WY)	7500	1/31	36	10.7	7.0	8.0	
NORTH FK. ELK CREEK	6250	1/31	38	11.2	10.0	8.6	
NORTH FK. ELK CREEK PILL	6250	1/31	SP	11.2	9.8	8.4	
NORTHEAST ENTRANCE	7400	1/27	36	10.3	7.8	6.6	
NORTHEAST ENTRANCE PILL.	7400	1/27	SP	9.8	7.1	7.0	
OLD FAITHFUL(WY)	7360	1/29	41	13.2	•		
OPHIR PARK	7150	2/01	48	16.8	12.2	•	
PETERSON MEADOWS	7200	1/28	37	11.1	6.3	**	
PETERSON MEADOWS PILLOW	7200	1/28	SP	11.2	7.0	900	
PICKET PIN LOWER	6200	2/02	10	2.4	3.6	en e	
PICKET PIN MIDDLE	7250	2/01	42	15.0	13.4	-	
PICKET PIN UPPER	8100	2/01	53	20.4	17.4	-	
PICNIC GROUNDS	6200	1/28	14	3.6	3.4	3.0	
PIPESTONE PASS	7200	1/27	22	6.4	4.7	3.8	
PIPESTONE UPPER #2 (AL) POORMAN CREEK	5300 5100	1/30	28	6.6	5.7	6.3	
POORMAN CREEK PILLOW	5100	1/28	57 SP	20.7	23.3	26.8	
ROCK CREEK MEADOWS	8160	1/29	62	17.9	20.0	22.8	
ROCKER PEAK	8000	1/29	48	15.9	10.6	11.1	
ROCKER PEAK PILLOW	8000	1/29	SP	14.9	10.3	11.4	
ROCKY BOY	4700	1/26	8	2.7	3.0	3.4	
ROCKY BOY PILLOW	4700	1/26	SP	3.4	2.4	3.8	
SADDLE MOUNTAIN	7940	1/28	68	22.2	19.8	18.4	
SADDLE MOUNTAIN PILLOW	7940	1/28	SP	23.0	21.3	19.1	
SAWTELL MOUNTAIN (ID)	8710	1/29	64	22.2	12.9	26.1	
SHOWER FALLS	81.00	1/29	62	21.1	19.4	16.6	
SHOWER FALLS PILLOW	8100	1/29	SP	20.4	19.1	16.7	
SPOTTED BEAR MOUNTAIN	7000	1/30	44	11.0A	13.5	11.4	
SPUR PARK	8000	1/28	51	17.0	15.8	16.7	
SPUR PARK PILLOW	8100	1/28	SP	17.2	15.8	16.4	
STAHL PEAK	6050	1/26	85	28.8	979	-	
STAHL PEAK PILLOW	6050	1/26	0	23.8	-	-	
STORM LAKE	7780	1/28		13.8		9.5	
STUART MILL	6500	1/28	21	5.8	5.0	4.8	
SUCKER CREEK	3960	1/23		. 0	.0		
SYLVAN PASS (WY)	7100	2/01	46	14.7	8.4	9.4	
TARGHEE PASS (ID)	7000	1/29		11.1	6.9	12.0	
TAYLOR ROAD	4080	1/23		1.2	2.9	en E: 11	
TEN MILE LOWER	6600	1/29		5.2	5.8 9.0	5.4	
TEN MILE MIDDLE	6800 8000	1/28		11.3		8.2	
TEN MILE UPPER TEPEE CREEK	8000	5/05		12.7		11.7	
TEPEE CREEK PILLOW	8000	5/05	SP		8.4	T1.	
THUMB DIVIDE (WY)	7900	1/29		15.4	8.3	15.4	
TRAIL CREEK	7090	2/03		8.0	- 0 - 0	10.4	
TV MOUNTAIN	6800	2/02		14,9		13.2	
TWELVEMILE CREEK	5600	1/29		17.3			
TWELVEMILE CREEK PILLOW	5600	1/29		15.5	15.9		
I Married for Landson, C. Linker, L. T. Polic C. M.	0000	-7 10 7	Ç,	2060		200	



SNOW		THIS YEAR	PAST RECORD			
DRAINAGE BASIN and/o. SNOW COURSE	Date	Snow Depth	Water Content	Water Content (inches)		
NAME	Elevation	of Survey	(Inches)	(Inches)	Last Year	Average
TWENTY-ONE MILE	7150	1/29	47	15.5	10.4	12.7
TWIN CREEKS	3580	1/30	26	7.5A	10.5	9.8
VALLEY VIEW (ID)	5500	1/29	40	12.0	7.7	12.3
WALDRON	5600	2/01	21	6.4	, 6	4%
WALDRON PILLOW	5600					9.9
WEASEL DIVIDE	5450	1/26	69	24.2	•	619
WEST ROSEBUD	7500	1/21	38	12.0	-	7.1
WEST YELLOWSTONE	6700	1/29	35	11.1	5.9	8.2
WEST YELLOWSTONE PILLOW	6700	1/30	SP	8.3	4.3	6.6
WHISKEY CREEK	6800	1/30	52	17.7	11.2	gris.
WHISKEY CREEK PILLOW	6800	1/30	SP	14.7	9.4	0.00
WHITE ELEPHANT (ID)	7700	1/29	54	18.6	10.0	-
WHITE MILL	8700	1/27	76	27.0	17.2	en .
WHITE MILL PILLOW	8700	1/27	SP	22.5	15.3	679
WILLOW CREEK	6500	5/05	30	8.1	7.6	-
WOLVERINE (WY)	7650	2/01	45	14.7	10.2	49
	LATE ARRI	VING DAT	A			
DIG COUNTS		- 1				
BIG COULEE	5100	2/05	15	4.1	4.1	-
HIGHWOOD DIVIDE	5650	2/05	28	7.6	6.5	
HIGHWOOD STATION	4600	2/05	9	2.5	3.2	





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Meauring Detes 2/		11.2 12.2 12.4 13.4 13.4 13.5 13.5 13.5 13.5 13.5 14.5 15.5 16.5	3,4,5 3,4,3 3,4,5 1,2,3,4,5,5%,6 Monthly	8 8 8 8 8 4 4 4 4 4 8 8 8 8 8 8 8 8 8 8	Monthly 1,2,5,4,5 1,2,3,4,5 1,2,5,4,5 1,2,5,4,5	ຄູດ ໄດ້ ຊູດ ຊູດ ຊ ຄູດຊູດ ຊ	1,2,3,4,5 1,4,5 1,4,5 3,4,5 Seasonally 1,4,3,31,6 1,2,3,4,5,5,6	3.48,3 3.48,3 3.48,3 1.23,48,3 1.48,5 3.48,5 3.48,5 1.23,48	1,1,4,5 7,5,4,3 Posthly 1,4,3 1,4,3	3,4,5 3,4,5 3,4,3,35,6 3,4,5,55,6		1, Sebrusry 1	cetion of Forestry and Resources d Wildlife section Oterri
Sensors in Addition to Snow Courges 1/									S S C	7		te on Jenusry wind run ste	ural Experiment Stetlon To Moneso Achool of Postettry To Targy, Minas and Resources Octet Fisheries and Wildlife STRATO Conservation of Conservation Gisti
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# Agencies and Organizations Cooperating in Montana Snow Surveys

## GOVERNMENT AGENCIES

# Canada:

Water Survey of Canada, Calgary, Department of the Environment
Water Resources Service, Department of Lands, Forests and Water Resources, British Columbia

## Federal:

Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service

Soil Conservation Service

U.S. Department of Commerce NOAA, National Weather Service

U.S. Department of the Interior
Bonneville Power Administration
Bureau of Indian Affairs
Bureau of Reclamation
Fish and Wildlife Service
Geological Survey
National Park Service

## STATE

Montana Association of Conservation Districts
Montana Department of Fish and Game
Montana Department of Natural Resources and
Conservation
Montana State University - Agricultural Experiment
Station
University of Montana - School of Forestry

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Montana Power Company

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